

WHAT IS CLAIMED IS:

1. A semiconductor optical waveguide device, comprising:
a semiconductor substrate;
a plurality of substantially S-shaped bent waveguides embedded in
5 the semiconductor substrate;
at least two optical waveguide returning parts which are interposed
between a light input end and a light output end of the bent waveguides,
each of said optical waveguide returning parts including a multiplexing
portion; and
10 light reflecting parts each formed on a rear end side of the
multiplexing portion of each of the optical waveguide returning parts, inside
the semiconductor substrate.
2. The semiconductor optical waveguide device according to Claim
15 1, wherein each of the optical waveguide returning parts comprises a Y-
branch.
3. The semiconductor optical waveguide device according to Claim
1, wherein each of the optical waveguide returning parts comprises an MMI
20 coupler.
4. The semiconductor optical waveguide device according to Claim
1, wherein each of the optical waveguide returning parts comprises a
directional coupler.

5. The semiconductor optical waveguide device according to Claim 1, wherein the optical waveguide returning parts and the light reflecting parts are formed at a predetermined depth level within the semiconductor substrate.

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6. The semiconductor optical waveguide device according to Claim 1, wherein each of the bent waveguides includes a core layer and a clad layer, said core layer being made of an InGaAsP material, said clad layer being made of an InP material, wherein the optical waveguide device is applied with an incident light at a wavelength band of 1.55 μm , and the bent waveguides have a radius of curvature of at least 2400 μm .

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7. The semiconductor optical waveguide device according to Claim 1, wherein a vapor-deposited metal film having a reflectance of at least 30% is formed on an end surface of each of the light reflecting parts.

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8. The semiconductor optical waveguide device according to Claim 7, wherein the metal film for reflection is made of aluminum.

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9. A semiconductor optical waveguide device, comprising:
a semiconductor substrate;
a plurality of substantially S-shaped bent waveguides each formed in a shape of a ridge on the semiconductor substrate;
at least two optical waveguide returning parts which are interposed between an input end and an output end of the bent waveguides, each of

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said optical waveguide returning parts including a multiplexing portion;
and

light reflecting parts each formed on a rear end side of said
multiplexing portion of each of the optical waveguide returning parts,

5 wherein each of the waveguides includes a core layer formed on an
upper surface of the semiconductor substrate and a clad layer formed on
said core layer.